Remarks

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested. Amendments include an emphasis on the utilization of colorants, cobalt or nickel (II) oxides, separately or in combination with each other (or with other transition metal species) added to a porous glass composition to create a tint that significantly reduces the background fluorescence signal when scanning for biomolecular probe attachments.

Claims 1-3, 5, and 7-23 remain in this application. Claims 4 and 6 have been cancelled. Claims 1, 2, 8, 10, 11, 13, 18, and 21 have been amended. Claims 24 and 25 have been added.

1. Drawings

The Examiner has indicated in the accompanying form PTO-948 that the informal drawings previously submitted have not been approved. Formal drawings are submitted with this Response for the Examiner's review and approval, along with a cover letter to the Official Draftsman.

2. § 112 Rejections

The Examiner has rejected claims 1-23 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out or distinctly claim the invention. The terms "primarily" and "a number of" were objected to by the Examiner as lacking definiteness and have been deleted from claims 1 and 18. Further, the term "inorganic" was positioned to encompass and clarify the inorganic composition of the porous region. In claims 1 and 18, the term "can be immobilized" has been amended to read "capable of immobilizing" so it is clear that the porous region is capable of immobilizing probe molecules.

Claim 4 has been cancelled.

Claims 8 and 10 have been amended to clarify that at least one of the recited colorants, Co_3O_4 or NiO, are required and R_xO_y, which is a transition metal oxide is optional. Though the weight percentage of R_xO_y can be zero, the values of x and y must be at least greater than zero to take into account the possible transition metal oxide composition. These

amendments clear any confusion as to the essential and optional components of the tinted porous region.

Regarding claims 11 and 12, the objectionable language, "chemically and mechanically durable", has been removed.

In amended claim 13, "before a GAPS-coating process" has been removed to eliminate any confusion as to the characteristics to the porous region.

3. § 102 Rejections

The invention of the present patent application relates to a porous substrate with the capability of enhancing detection of immobilized biomolecules on its surface, providing higher sensitivity, and thus greater accuracy. Through the ability to generate much greater signal intensity from a sample, porous substrates provide significant advantages over non-porous substrates. Their enhanced ability to retain nucleic and/or other probe moieties for high-density arrays proves superior. Unfortunately, porous substrates may also be associated with increased levels of auto-fluorescence or noise, which adversely affects signal to noise ratio. The substrate of this invention exhibits a porous inorganic region which has a composition incorporating a colorant specifically designed to reduce the relative level of reflectance and auto-fluorescence detected. It has been demonstrated that significant reduction in background fluorescence may be achieved through the use of these colorants, thereby appreciably increasing the signal to noise ratio.

The Examiner has rejected claims 1-9 and 13-23 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application No. 2003/0054176 (Pantano).

While Pantano recognizes and identifies as a problem the presence of auto-fluorescence from the solid glass support, Pantano fails to offer or even suggest the solution that is the subject of the present invention. Specifically, Pantano fails to disclose or suggest the porous region have a "tint" to reduce the level of auto-fluorescence. It is through selected addition of transition metal ions that the applicants have achieved the required tint, the effect of which is to reduce auto-fluorescence. Pantano actually teaches that in order to maintain low levels of auto-fluorescence one should employ glasses whose structure specifically excludes transition metal ions (see Pantano, paragraph [0022]). The present invention is based upon just the opposite; namely the incorporation of transition metal ions into the glass structure.

The Examiner asserts that Zinc (as incorporated into an exemplary Pantano composition) constitutes a colorant that would presumably instill the tint as required by all claims (See Office Action p. 5, ln 3-4). It is well established in the glass chemistry art that zinc does not serve to color or tint the glass and therefore cannot be considered a colorant or tint for purposes of the invention as claimed.

A rejection under 35 U.S.C. § 102 requires that the Pantano reference, in order to anticipate the present invention, teach or suggest all the claim limitations disclosed by the claim. The claimed invention requires the substrate of this invention have a tinted porous region that is not taught or suggested by the Pantano reference. Since rejected independent claims 1 and 18 both require this limitation, it is respectfully submitted that they are in condition for allowance. Likewise, since dependent claims all require this limitation of the first claim, it is respectfully submitted that they too are in condition for allowance.

Support for claims 24 and 25 can be found in the specification (pg 17, ln 8-9). The cited references do not teach or suggest a tinted porous region having pore sizes greater than 0.5 μm.

4. § 103 Rejections

The Examiner has rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable for obviousness over U.S. Patent Application No. US 2003/0054176 (Pantano) in light of U.S. Patent Application No. US 2003/0003474 (Tanner). Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable for obviousness over Pantano in light of U.S. Patent No. US 6,391,809 (Young '809).

Claim 10 requires a ". . . porous region having a tint." In order to establish a prima facie case of obviousness, the Pantano and Tanner references in combination must teach or suggest all the claim limitations. As previously discussed, Pantano fails to recite or suggest a porous region having a tint. Likewise, Tanner does not teach or suggest a porous region having a tint for reducing autofluoresence.

Claims 11 and 12 require a ". . . porous region having a tint." In order to establish a prima facie case of obviousness, the Pantano reference and Young (US 6,391,809) in combination must teach or suggest all the claim limitations. As earlier recited, Pantano fails to teach or suggest a porous region having a tint. In the same way, Young does not satisfy this deficiency.

5. Conclusion

Based upon the above amendments, remarks, and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests consideration of added claims 24-25 as well as reconsideration of the pending claims 1-23 and a prompt Notice of Allowance thereon.

Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Thomas R. Beall at (607) 974-3921.

Respectfully submitted,

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